



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005MD99B

Title: Utilization of High Carbon Fly Ash to Remediate Groundwater-Summer Student Research

Project Type: Research

Focus Categories: Toxic Substances, Groundwater, Hydrogeochemistry

Keywords: reactive barrier, fly ash, organic chemicals

Start Date: 06/01/2005

End Date: 09/15/2005

Federal Funds: \$3,800

Non-Federal Matching Funds: \$7,679

Congressional District: Maryland 5

Principal Investigator:

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Abstract

This proposed research program mainly aims to evaluate the suitability of a Maryland waste material. Class F fly ash with high unburned carbon content, in conventional reactive barriers for removal of hydrophobic organic pollutants from contaminated subsurface waters contamination. The objective of this study is to investigate the fundamental factors affecting the behavior of a reactive barrier incorporated with fly ash. The re-use of high carbon Class F fly ash has a potential for minimizing the movement of organic chemicals found in the soil and the groundwater. In a preliminary analysis conducted at the University of Maryland indicated that the fly ash from the Brandon Shores Plant located in Baltimore has a significant amount of sorption capacity for naphthalene. During the experimental work we will take the advantage of high carbon content and small particle size characteristics of cyclone-produced Class F fly ash. These properties can be advantageous in remediation of soils originally polluted with petroleum-based contaminants (e.g. naphthalene, o-xylene). Two major testing techniques will be employed; (1) Batch-scale adsorption tests will be conducted to determine adsorption capacity of high carbon content Maryland fly ashes. (2) Column

adsorption tests will also be examined to ensure the scale effect of batch tests to field applications and to evaluate the transport parameters.